

## WHAT IS CLAIMED IS:

## 1. A warning apparatus for a vehicle, comprising:

an operation part configured to provide a contact possibility of the vehicle contacting  
5 with an object that is present in front of the vehicle according to relative motion between the  
vehicle and the object;

a warning unit configured to provide a contact possibility warning by applying a  
negative acceleration to the vehicle, the negative acceleration being produced according to a  
correction value that is set by the warning unit according to the contact possibility and is applied  
10 to at least one of the driving force and the braking force of the vehicle; and

a controller configured to change the correction value according to a speed of the  
vehicle.

## 2. The warning apparatus of claim 1, wherein:

15 the warning unit sets a first correction value according to a first collision time, to  
produce the negative acceleration, the first collision time being provided by the operation unit  
according to a distance between the vehicle and the front object and a relative speed between the  
vehicle and the front object; and

the controller changes the first correction value such that the first correction value  
20 increases as the speed of the vehicle increases.

## 3. The warning apparatus of claim 1, wherein:

the warning unit sets a second correction value according to a second collision time, to  
produce the negative acceleration, the second collision time being provided by the operation  
25 unit according to a distance between the vehicle and the front object and a speed of the vehicle;  
and

the controller changes the second correction value such that the second correction  
value decreases as the speed of the vehicle increases.

## 30 4. The warning apparatus of claim 2, wherein:

the warning unit sets a second correction value according to a second collision time, which is provided by the operation unit according to the distance between the vehicle and the front object and a speed of the vehicle, and selects a larger one of the first and second correction values to produce the negative acceleration; and

5           the controller changes the second correction value such that the second correction value decreases as the speed of the vehicle increases.

5. The warning apparatus of claim 4, wherein the second correction value is set according to comparison between the second collision time and a second threshold and according to the  
10   second collision time.

6. The warning apparatus of claim 5, wherein the first correction value is set according to comparison between the first collision time and a first threshold and according to the first collision time.

15           7. The warning apparatus of claim 5, wherein the second correction value is set to zero in a case where the second collision time is greater than the second threshold, and in other cases, is increased as the second collision time decreases.

20           8. The warning apparatus of claim 6, wherein the first correction value is set to zero in a case where the first collision time is greater than the first threshold, and in other cases, is increased as the first collision time decreases.

9. The warning apparatus of claim 4, further comprising  
25           a classifier configured to classify a road on which the vehicle is running, wherein  
              in a case where the classifier classifies the road as an open road, the controller increases the first correction value than that for an expressway.

10. The warning apparatus of claim 4, further comprising  
30           a classifier configured to classify a road on which the vehicle is running, wherein

in a case where the classifier classifies the road as an open road, the controller increases the second correction value than that for an expressway.

11. The warning apparatus of claim 9, wherein in a case where the classifier classifies the road  
5 as an open road, the controller increases the second correction value than that for an expressway.

12. A warning apparatus for a vehicle, comprising:

an operation means configured to provide a contact possibility of the vehicle  
contacting with an object that is present in front of the vehicle according to relative motion  
10 between the vehicle and the object;

a warning means configured to provide a contact possibility warning by applying a  
negative acceleration to the vehicle, the negative acceleration being produced according to a  
correction value that is set by the warning means according to the contact possibility and is  
applied to at least one of the driving force and the braking force of the vehicle; and

15 a control means configured to change the correction value according to a speed of the  
vehicle.

13. A warning method for a vehicle, comprising:

providing a contact possibility of the vehicle contacting with an object that is present  
20 in front of the vehicle according to relative motion between the vehicle and the object;

producing a negative acceleration according to a correction value that is set according  
to the contact possibility and is applied to at least one of the driving force and the braking force  
of the vehicle;

warning to provide a contact possibility warning by applying the negative acceleration  
25 to the vehicle; and

controlling to change the correction value according to a speed of the vehicle.